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PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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Career Plans and Debt Levels Of Graduating U.S. Medical Students, 1981–1986

Cynthia Tudor, Ph.D.

Abstract—Trends in students' responses to the annual graduation questionnaire of the Association of American Medical Colleges from 1981 to 1986 were examined. Since 1981 the percentage of students choosing primary care specialties dropped from 43.6 percent to 36.6 percent. The decline of interest in primary care specialties occurred mainly in general internal medicine. Changes in career activity since 1981 reflected increasing interest by the students in full-time academic appointments and decreasing interest in solo, private practices. Changes in the size of a city in which students planned to practice reflected an increasing interest in large cities or suburbs. The students' preferences for certain geographic regions of the country for practice locations changed very little. Finally, total postsecondary educational debt increased from an average of $19,697 in 1981 to an average of $33,499 in 1986. This difference represents a 70 percent increase as measured by 1987 dollars and a 37 percent increase in constant dollars.

A graduation questionnaire (GQ) is administered annually by the Association of American Medical Colleges (AAMC) to all graduating seniors at U.S. medical schools. The questionnaire has been completed by approximately 65 to 70 percent of each graduating class since it was first administered in 1978. The analysis reported here examined trends from 1981 through 1986 in the responses to the GQ.

Since all graduates do not complete the graduation questionnaire, underrepresentation by a group in the sample of GQ respondents may bias the findings. For example, blacks comprised 5.1 percent of the 1986 graduating class but only 3.6 percent of the GQ respondents. Since blacks are more likely to locate in a socioeconomically deprived area than are whites, GQ results may underestimate the extent to which medical school graduates are likely to locate in these areas. Responses to the GQ seem to reflect accurately the sex distribution and public/private school distribution of 1986 graduates.

Table 1 shows the choice of specialization for students who had definitely decided on a specialty by the time they completed the questionnaire. The percentage of students choosing primary care specialties (family practice, general internal medicine, general obstetrics-gynecology, and general pediatrics) dropped from 43.6 percent in 1981 to 36.6 percent in 1986. The decline of interest in primary care specialties occurred mainly in gen-

Dr. Tudor is director of student studies, Section for Student and Educational Programs, Association of American Medical Colleges, Washington, D.C.

TABLE 1

Percentages of U.S. Graduating Medical Students with Definite Preferences Who Preferred Each of 25 Specialties, 1981 Through 1986*

Specialties	1981	1982	1983	1984	1985	1986
Allergy and immunology	0.2	0.1	0.2	0.2	0.2	0.3
Anesthesiology and critical care	4.2	5.0	5.5	6.2	6.6	6.0
Dermatology	1.2	0.9	1.2	1.4	1.6	1.8
Emergency medicine	2.6	2.4	2.7	3.0	3.0	3.5
Family practice	17.3	18.2	17.7	17.0	15.9	17.0
Internal medicine						
General	12.7	13.9	12.7	10.4	10.3	8.3
Subspecialties	5.9	3.1	3.7	3.9	4.6	5.0
Neurology and child neurology	1.4	1.9	1.6	2.1	2.3	2.6
Nuclear medicine	0.1	0.0	0.0	0.0	0.0	0.1
Obstetrics-gynecology						
General	6.3	7.4	6.8	7.7	6.0	5.9
Subspecialties	1.6	1.0	1.1	1.1	1.2	1.3
Ophthalmology	3.8	3.9	3.8	3.9	4.0	4.2
Pathology	2.5	2.7	3.1	2.4	2.1	2.1
Pediatrics						
General	7.3	6.8	6.5	6.6	5.6	5.4
Subspecialties	1.5	0.7	0.8	0.8	1.0	1.3
Physical medicine and rehabilitation	0.6	0.6	0.9	0.9	1.3	1.6
Preventive medicine	0.2	0.2	0.1	0.2	0.2	0.2
Psychiatry and child psychiatry	4.8	5.2	5.0	4.7	6.0	6.4
Radiology and subspecialties	5.3	5.3	6.1	6.5	6.6	6.2
Surgery						
General	6.3	6.0	5.5	6.0	6.1	6.2
Subspecialties†	3.1	2.3	2.5	2.6	2.2	2.2
Neurological surgery	1.3	1.1	1.1	0.9	1.1	0.9
Orthopedic surgery	6.0	6.9	6.6	6.4	6.6	6.7
Otolaryngology	2.0	2.5	2.3	2.3	2.6	2.6
Urology	1.3	1.6	1.8	2.3	2.4	2.1
No specialty specified	0.6	0.2	0.5	0.4	0.6	0.3

* The percentages represent only those respondents who had definitely decided on a specialty: 1981 = 10,795 responded to questionnaire, 8,809 had preference; 1982 = 10,938 responded, 8,097 had preference; 1983 = 10,481 responded, 7,747 had preference; 1984 = 10,547 responded, 7,752 had preference; 1985 = 11,048 responded, 8,114 had preference; and 1986 = 10,739 responded, 7,657 had preference. Columns may not total 100 percent due to rounding.

† Includes critical care, pediatric, plastic, thoracic, and colon and rectal surgery subspecialties.

eral internal medicine, which dropped from 12.7 percent in 1981 to 8.3 percent in 1986. The percentages choosing anesthesiology, emergency medicine, neurology and child neurology, psychiatry and child psychiatry, radiology, and orthopedic surgery increased slightly.

The students' responses concerning choice of career activity revealed few changes since 1981, as shown in Table 2. The percentage of students desiring to practice medicine alone decreased from 5.0 percent in 1981 to 3.4 percent in 1986, while the percentage choosing clin-

TABLE 2

Percentages of U.S. Graduating Medical Students Who Preferred Different Career Activities, 1981 Through 1986*

Career Activities	1981	1982	1983	1984	1985	1986
Full-time academic faculty appointment						
Basic science teaching and research	1.0	0.9	1.1	1.2	1.2	1.0
Clinical science teaching and research	21.5	20.9	23.3	22.5	26.4	26.7
Salaried research scientist position						
Basic medical sciences	0.2	0.1	0.2	0.3	0.2	0.2
Clinical sciences	0.5	0.3	0.4	0.5	0.3	0.3
Private clinical practice						
Alone	5.0	4.3	3.9	3.8	3.3	3.4
In participation with one other physician	11.3	11.7	10.7	11.0	9.3	9.3
In a group of three or more physicians	35.2	36.2	35.1	36.4	35.2	35.7
Undecided among the other private practice options	12.0	12.2	11.4	11.3	10.1	9.4
Salaried clinical practice						
Hospital	6.4	6.1	6.4	6.4	6.1	6.2
Prepaid group clinic	2.9	2.3	2.6	2.6	2.7	2.6
State or federal agency	3.0	3.7	3.7	3.4	3.2	3.1
Administrative position—no practice	0.2	0.2	0.2	0.2	0.2	0.2
Other	†	†	†	†	1.3	1.4
No response	0.7	0.9	0.8	0.6	0.6	0.5

* The numbers of respondents for each year were: 1981 = 10,795, 1982 = 10,938, 1983 = 10,481, 1984 = 10,547, 1985 = 11,048, and 1986 = 10,739. Percentages in each column may not total 100 due to rounding.

† "Other" response not included in questionnaire in these years.

ical practice with a group of three or more physicians increased slightly. The percentage of students choosing a prepaid group clinic as their practice location remained stable at about 3 percent.

The percentage of students who chose a full-time academic appointment as their primary career interest increased from 22.5 percent in 1981 to 27.7 percent in 1986. However, data extracted from the AAMC's Medical College Faculty Roster System show that almost 20 percent of medical school graduates become faculty members within 10 years of graduation. Thus, the percentage of graduates who actually begin a full-time academic career is less than the percentage who chose an academic appointment as their primary career interest at graduation. This difference may reflect merely the difference between aspirations and achievement.

Only about one-fifth of the graduating students in 1986 planned to take a research fellowship. This percentage dropped from about 24.4 percent in 1981 to the 1986 level of 20.1 percent. This proportion reflects a declining percentage of students who planned a research fellowship and an increasing discrepancy between those who desired an academic career and who planned a research fellowship since 1981. A research fellowship is considered by many to be a prerequisite to an academic career. However, the GQ question concerning a research fellowship was changed in 1984 to include an "undecided" category. If the respondents in 1986 who were undecided are distributed

between the "yes" and "no" categories in the same proportion as those who were decided, then the percentage of students who actually planned a research fellowship would be 27.5 percent. The percentage who had decided against a fellowship would be 72.2 percent. These adjusted figures show an increase since 1981 in the percentage of respondents who plan a fellowship, an increase that is in line with the increase in those who plan an academic career. Thus, the adjusted proportion of students who in 1986 planned a fellowship (27.5 percent) is approximately the same as the proportion of students that year who planned a full-time academic career (27.7 percent).

Graduating medical students changed the choice of their practice setting locations since 1981. For example, the percentage of students desiring to practice in a suburb of a large city increased from 10.3 percent in 1981 to 15.0 percent in 1986. In contrast, the percentage desiring to practice in small-size cities or towns dropped from 23.8 percent in 1981 to 16.4 percent in 1986.

The region of the country in which students planned to practice remained fairly stable over the six years. Approximately 24.1 percent of the respondents in 1986 planned to practice in the northeast, while 21.8 percent and 20.7 percent planned to practice in the south and west, respectively; 18.2 percent planned to practice in the midwest, and 13.1 percent were undecided.

From 1981 through 1983, graduating students were asked whether they would consider locating in a socioeconomically deprived area. The results showed that over half of the respondents in each year would consider this practice location. However, in 1984 the question was changed to, "Do you plan to locate in a socioeconomically deprived area?" To that question, only 15.2 percent of the respondents in 1986 answered affirmatively.

Table 3 shows the amounts of total postsecondary educational debt incurred by respondents to the questionnaire. Until 1986 the percentage of students who had incurred no debt decreased, from about 23 percent in 1981 to 13 percent in 1985. In 1986, however, the percentage of students who had not incurred any debt increased to 18 percent.

Variations in the distribution of debt from 1981 to 1986 may be attributed to several changes in response patterns. First, there has been an increase since

TABLE 3

Percentages of U.S. Graduating Medical Students Who Reported Amount of Total Educational Debt at Each Debt Level, 1981 Through 1986*

Amounts	1981	1982	1983	1984	1985	1986
No debt	23.0	17.1	13.8	11.9	13.4	17.9
$1 to $4,999	4.8	4.3	3.5	2.9	2.7	3.1
$5,000 to $9,999	8.7	7.6	6.4	6.3	8.8	6.2
$10,000 to $14,999	11.8	11.3	9.5	9.9	6.3	5.4
$15,000 to $19,999	15.7	17.3	15.2	9.4	7.0	6.2
$20,000 to $24,999	12.2	14.9	16.6	16.8	12.9	10.2
$25,000 to $29,999	9.2	9.0	10.2	11.3	10.3	9.7
$30,000 to $49,999	13.0	15.5	20.0	23.5	25.8	24.6
$50,000 or more	1.5	2.9	4.7	8.1	12.8	16.8

* The numbers of respondents to the question on debt were: 1981 = 8,148, 1982 = 10,498; 1983 = 10,073, 1984 = 8,041, 1985 = 10,844, and 1986 = 10,623. Totals in each column may not total 100 due to rounding.

1981 in the number of students who provided information on whether or not they had incurred educational debt. Second, the types of individuals who responded to the questionnaire changed. In particular, there were changes in the proportion of each racial or ethnic group that responded to the questionnaire. Analysis of the reasons for the changes continues.

The general decline in the proportion of students who incurred no debt was accompanied by an increase of 15 percentage points in the proportion of students with debts exceeding $50,000 (from 2 percent in 1981 to 17 percent in 1986). The average debt for indebted respondents rose from $19,697 in 1981 to $33,499 in 1986, a 70 percent increase as measured by 1986 dollars. In constant 1981 dollars, the 1986 debt represented $27,069. In constant dollars, the average debt increased by about 37 percent.

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The Regional Graduate Medical Education Program Of the University of Washington

David C. Dale, M.D., Benjamin H. Belknap, M.D., John D. Chase, M.D., and James W. Haviland, M.D.

Abstract—To address problems of geographic and specialty distribution of physicians in the states of Washington, Alaska, Montana, and Idaho, the University of Washington School of Medicine and its affiliated hospitals developed a regional program of graduate medical education beginning in 1971. The program in 1986–87 had 77 percent of the residency positions in the region and involved more than 30 hospitals and clinics. In 1986–87, 58 percent of the residents completing training were in family medicine, internal medicine, or pediatrics. The program is centrally coordinated by the school's associate dean for clinical affairs, who works with departmental program directors and hospital and university administrators.

The cost, content, and control of programs for graduate medical education (GME) are currently matters of public and professional controversy. A number of reports (1–4) in this decade have addressed problems with the training of the nation's 75,000 residents, training that now costs almost $3 billion annually.

The present system of GME reflects the balancing of the interests of several groups: the Accreditation Council for Graduate Medical Education (ACGME), specialty boards and specialty societies, hospital boards and administrators, medical school deans and faculties, residency program directors, residents, and the medical profession at large. Many have suggested changing this system by restructuring GME to emphasize its educational elements, regulating the size of programs to match more closely the needs for physicians trained in various specialties, focusing control of programs in publicly appointed committees or boards, and shifting more of the responsibility for oversight of GME either to teaching hospitals or to medical schools.

In 1971 an ad hoc Committee on Graduate Medical Education of the Association of American Medical Colleges (AAMC) recommended unifying responsibility for GME under the direction of medical schools and their parent universities (5). Although a policy statement based on this report was adopted in principle by the assembly of the AAMC, for many reasons its implementation has occurred slowly.

Concomitant with the AAMC study and other plans for reorganizing GME (6), the University of Washington School of Medicine in 1971 began a major regional medical education program for the

Dr. Dale and Dr. Belknap are professors of medicine, Dr. Chase is dean emeritus, and Dr. Haviland is clinical professor of medicine, and all formerly held positions as associate dean or dean, University of Washington School of Medicine, Seattle.

states of Washington, Alaska, Montana, and Idaho called the WAMI program. This program was begun to improve access to medical education for three states without medical schools (Alaska, Montana, and Idaho) and to match more closely the overall educational efforts of the existing school with the needs of the region. A part of this effort involved developing a regional GME program.

The present report describes the GME program that was developed by the University of Washington and its affiliated hospitals. In 1986–87 the program had 687 residents (77 percent of the residents in the WAMI region) working in more than 30 hospitals and clinics in the four-state area.

Description

The University of Washington School of Medicine was begun in 1945. Before the school opened, there were several internship programs and a few residency positions in the region, principally in Seattle, Tacoma, and Spokane. With the beginning of the University Hospital in 1959, it was decided that there should be single residency programs spanning multiple hospitals for each department under the auspices of the school. This was a key decision for long-term interhospital and interdepartmental cooperation and for the gradual amalgamation of regional GME positions into the university-based programs.

At approximately the same time the WAMI program began, a Department of Family Medicine and a network of family practice residencies were started (7, 8). Also, rotations to remote clinical units were begun in internal medicine, pediatrics, psychiatry, and surgery (9). In general, the school followed a deliberate strategy of expanding training in the primary care disciplines and selectively added residency positions so that each beginning resident could complete training in the region.

FUNDING AND ADMINISTRATION

Since 1960 some of the school's state support, the portion received through the university budget, has been used to fund directly the cost of the GME program, including residents' stipends. As the overall program grew and as the school sought to develop new contractual arrangements for resident rotations at remote sites, it became clear that a uniform salary agreement, with a single salary schedule and common fringe benefits, would be helpful. In the mid-1970s, a "Common Source Account," a self-sustaining account of the university, was created together with a standard interinstitutional agreement for the participating hospitals and clinics (except for the "Family Practice Residency Network," which was handled separately). The essential elements of this interinstitutional agreement were: to set numbers and levels of residents for each department at each hospital each year; to establish base salaries, fringe benefits, and payroll management fees; and to set billing and payment dates for the operation of the account. In 1986–87 more than 20 institutions participated in funding resident positions through this agreement. The family practice program receives direct state support (separate from the support received through the university budget) and support from a number of hospitals; it has a separate accounting and governance structure. The current sources of support for the GME program are shown in Figure 1.

The centralized management of a highly integrated GME program depends upon a cooperative spirit and farsightedness. From the hospitals' perspective, development of the cooperative program

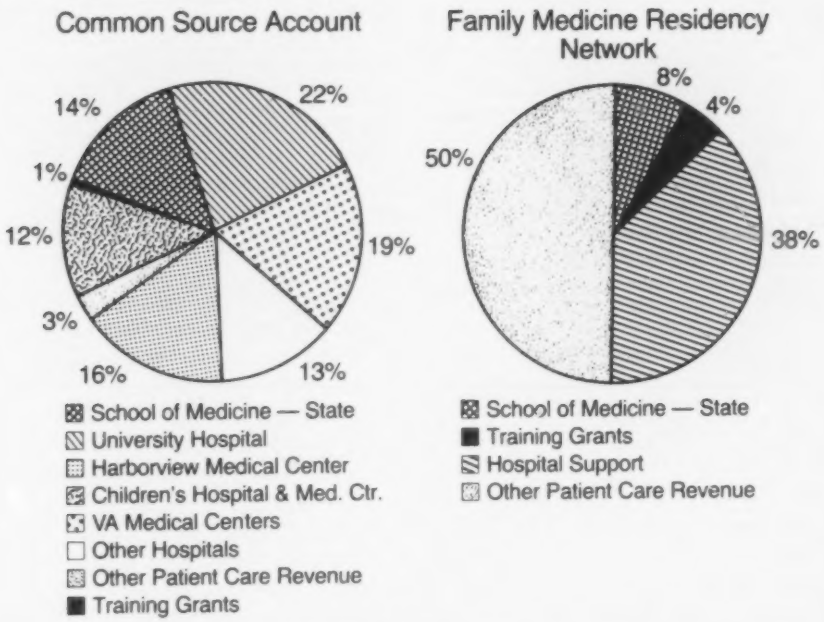

FIGURE 1

Percentages of funding for residents' stipends and benefits received from various sources by residency programs of the University of Washington (with the family practice program shown separately because it is administered separately from all other programs), 1986–87.

meant that they would be provided with good residents without the duplication of costs associated with maintaining their own systems for selecting, overseeing, and compensating residents. It also meant that the school would assume responsibility for maintaining program accreditation and for providing malpractice insurance for residents and for faculty members while engaged in teaching activities. The cooperation of the hospitals helped the school and its departments to attract better residents and to integrate its undergraduate and graduate medical education. The departments have kept their traditional responsibilities for selecting residents and supervising their clinical and educational activities.

A number of individuals are involved in managing the GME program. Although the program is accountable to the university president through the vice president for health sciences, most issues are resolved among the associate dean for clinical affairs in the School of Medicine, the hospital medical directors, and the program directors for the individual departments. The associate dean for clinical affairs coordinates the interest of the school's clinical departments with the resources and programs of hospitals and clinics in the region. That person also works with the ACGME and the residency review committees and with groups interested in health manpower needs of the region.

For the family medicine network, an advisory board chaired by the dean of the

medical school, provides governance and oversees the expenditures of state funds. This board is appointed by the governor of the state of Washington and includes lay and physician members.

Oversight for all the programs based in the three participating Veterans Administration hospitals (Seattle and Tacoma-American Lake in Washington and Boise, Idaho) is provided by a dean's committee for each institution.

PROBLEMS

The principal problem in maintaining the program is uncertainty about whether the federal government and other payers for hospital services will continue to pay for the direct and indirect costs of GME. A parallel concern is not knowing whether the teaching hospitals in the region can remain competitive with other hospitals. This dilemma is of greatest concern where hospital resources have been used to support residency programs in primary care, particularly in family medicine. The ambulatory care clinics required for these programs are relatively expensive to operate; they continually receive close budgetary scrutiny as hospital finances tighten. The organization, staffing, and efficient management of clinics for training residents are now important concerns in nearly every specialty.

Operating a widely dispersed GME program with centralized accounting and record-keeping requires good communication and coordination among the departments, the hospitals, and the the office of the associate dean for clinical affairs. Recently, a computer-based record-keeping system was developed. Indexing salaries to national averages for resident salaries, having clearly defined fringe benefits for residents, and anticipating problems through a faculty-house staff committee have proven very helpful.

Effects

In examining the effects of the WAMI program, the present authors considered the residents' specialties in the following seven categories: primary care specialties (general internal medicine and medical specialties, family practice, and general pediatrics and pediatric specialties); obstetrics and gynecology; psychiatry, including child psychiatry; general surgery, including plastic and thoracic surgery; surgical specialties (neurosurgery, ophthalmology, otolaryngology, orthopedics, and urology); hospital-based specialties (anesthesiology, nuclear medicine, pathology, radiation oncology, and radiology); and other specialties (dermatology, neurology, and rehabilitation medicine). Obstetrics and gynecology was not grouped with the primary care specialties, as done in some (1) but not all (3) reports.

The size of the residency programs in the WAMI network in 1986–87 and the average number of WAMI residency graduates from 1980 through 1986 are shown in Table 1, and the percentages of residents in training and graduating in various specialties are shown in Figure 2. Figure 2 shows a steady increase in the average percentages of trainees and graduates in the primary care specialties (internal medicine, family practice, and pediatrics) over the last 25 years. Because the years of training required in surgical and other specialties have increased but the number or percentage of positions allocated to them has changed little, the percentage of graduates in these specialties has steadily fallen.

Table 1 also gives estimates of the number of new physicians needed for the WAMI region and the output of the university program and of all programs in the region combined. In nearly every specialty or group of specialties, the annual output during 1980–1986 was less than

TABLE 1

Numbers of Trainees and Graduates of the University of Washington Residency Program, Numbers of Graduates of All Residency Programs in the WAMI Region, Numbers of Physicians in the Region, and Estimates of Physicians Needed in the Region

Residency Programs§	Total No. of UW Residents, 1986–87	Average No. of UW Residency Graduates per Year, 1980–1986	Average No. of Residency Graduates, Whole WAMI Region, per Year, 1980–1986	Based on AMA Data*		Based on GMENAC Report†		Based on HMO Staffing‡	
				No. of M.D.s in WAMI Region, 1985	Estimated No. of New Physicians Needed in WAMI Region Each Year**	Total No. of Physicians Required in WAMI Region in 1990	No. of New Physicians Needed in WAMI Region Each Year in 1990**	Total No. of Physicians Required in WAMI Region in 1990	No. of New Physicians Needed in WAMI Region Each Year in 1990**
Primary care specialties									
Family medicine	150	52.0	52.0	2,400	68.5	2,570	83.0	3,875	111.0
Internal medicine	153	41.5	57.5	2,113	60.0	3,685	105.0	1,700	48.5
Pediatrics	50	15.5	20.5	696	20.0	1,115	32.0	775	22.0
Obstetrics-gynecology	20	5.0	10.0	631	18.0	735	21.0	770	22.0
Psychiatry	42	11.0	11.0	638	18.0	1,455	41.5	300	8.5
General surgery	50	5.5	12.5	890	25.0	865	25.0	450	13.0
Surgical specialties	59	12.5	18.5	1,340	38.0	1,375	39.0	1,410	40.0
Hospital-based specialties	112	30.0	38.0	1,490	42.5	1,710	49.0	1,377	39.0
Other specialties	51	14.5	14.5	412	12.0	485	14.0	304	8.5
Total	687	187.5	223.5	10,610	302.0	13,995	400.0	10,961	313.0

* For source of data, see reference 10.

† For source of data, see reference 1.

‡ For explanation, see text.

§ For breakdown of specialties, see text.

** Derived by dividing total requirement for entire region by 35 (the estimated number of years a physician will practice).

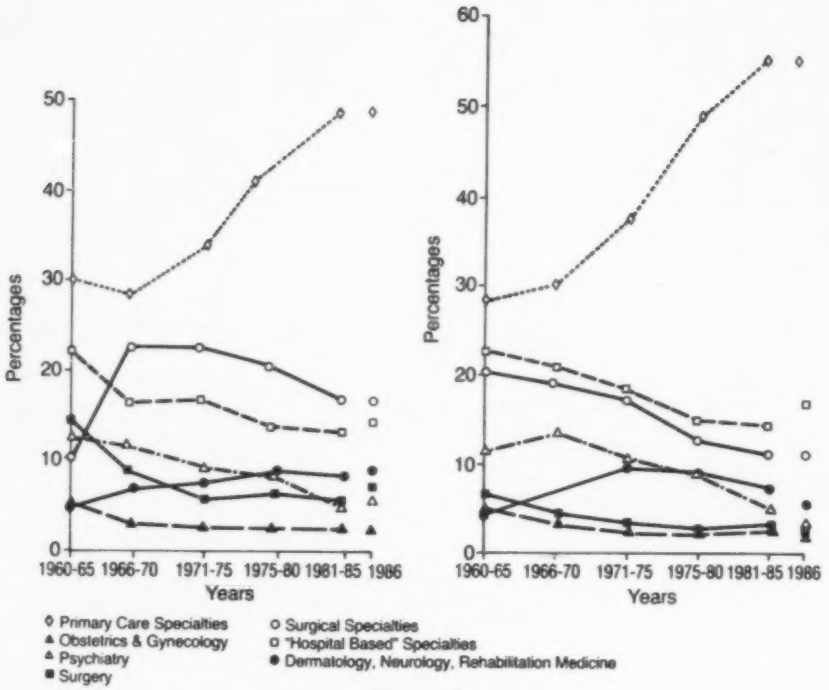

FIGURE 2

Average percentages of residents training in and graduating from residency programs in various categories of specialties (left panel based on actual number of residents working in each department each year; right panel based on actual number of residents in final year of training, as required for board certification in that specialty, each year), University of Washington, 1960–1986.

the projected requirement for the region, based on the data from the Graduate Medical Education Advisory Committee (GMENAC) or a simple equilibrium model in which new physicians replace physicians in practice at retirement after 35 years of practice. The only exception was the residency program in rehabilitation medicine, which produced more physicians each year for 1980–1986 than the estimated need. Rehabilitation medicine is, however, a specialty considered nationally to be undersupplied in the GMENAC study (1).

The number of GME graduates per year was also less than that which would be required for a hypothetical health maintenance organization (HMO) serving the whole WAMI region and staffed similarly to the Group Health Cooperative of Puget Sound, the largest HMO in the region (Table 1). If the expected practice time for physicians is extended to 40 years or reduced to 30 years, the GME program output would still be less than the projected regional need by any of these estimates.

A recent survey of the school's residency program directors, conducted as part of the preparation for the present report, revealed that only in family medicine, general internal medicine, general pediatrics, and psychiatry did the directors perceive a need for more than re-

placement numbers of new physicians in the WAMI region. This finding is not surprising given the changes in physician supply in this region between 1970 and 1985: the number of physicians increased by 88 percent, the population-to-physician ratio declined by 30 percent, and 53 percent of the physicians in the region as of 1985 were less than 45 years old (10). Although there are still towns and villages without a doctor, as of December 1985 no county (or borough, in Alaska) in the WAMI region with a population density greater than three people per square mile (national average, 67 per square mile) lacked a physician (10).

Discussion

This paper summarizes the history and operation of the GME program of a school with a long-term commitment to matching its training efforts to the needs for physicians in a large geographical region. Although the University of Washington School of Medicine is in some ways unique among the nation's medical schools and provides GME for only about 1 percent of the nation's resident physicians, its approaches to addressing major issues in GME may be useful for others considering these same concerns.

In the 1985 report of the Task Force on Academic Health Centers, sponsored by the Commonwealth Fund and titled "Prescription for Change," GME was listed first of three major topics in need of public understanding and examination (2). Cost, size, control, program content, and specialty distribution were highlighted as issues in this report. Similar issues were considered in the 1986 report of the New York State Commission on Graduate Medical Education (3) and elsewhere (4). Although these issues are closely interwoven, a key issue emerging in most reports is that of program management or control.

The strategy adopted at the University of Washington for oversight of GME is largely that proposed by the AAMC in 1971 (5) and similar to the system proposed for Michigan in 1974 (6) and New York in 1986 (3). The School of Medicine serves as the coordinating institution and the associate dean for clinical affairs as the manager for GME in the WAMI region.

With this organizational structure, the school and its affiliated hospitals have managed to maintain a high quality of residency training, as reflected by program approval by the ACGME and by demand for the training positions, and to create changes in the GME program which the school believes reflect appropriate responses to major national issues. The residency programs have grown but in a controlled way. The northwest and the WAMI region presently have the lowest number of entering GME positions per capita of any region in the United States, yet there are sufficient positions for the numbers of medical students who graduate from the University of Washington.

Estimates of the number of physicians required in the region based on a replacement model, the GMENAC study, and a comparison of the program's output with the staffing needs of the Group Health Cooperative all suggest that the proportion of trainees in various specialties is, in general, a reasonable match with the projected needs for the region by specialty but that the program's annual output is somewhat less than the region's projected annual need. On the other hand, a number of factors now indicate that little further growth can be justified. Although only about 50 to 60 percent of the school's GME graduates will remain in the WAMI states, based on a study (11) published in 1986, and a number will enter academic careers, there is every reason to believe